Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Advanced Television Systems	)	
and their Impact Upon the	)	MM Docket No. 87-268
Existing Television	)	
Broadcast Service	)	

Comments
of the
New York Metropolitan Advisory Committee

The New York Metropolitan Advisory Committee:

New York City Police Department
New York City Fire Department
New York City Department of Corrections
New York City Department of Parks and Recreation
New York City Department of Information Technology and Telecommunications
New York City Department of Transportation
New York City Transit Authority
City of Yonkers, New York, Fire Department
City of Yonkers, New York, Police Department
City of New Rochelle, New York, Police Department
Nassau County, New York, Police Department
Suffolk County, New York, Police Department (Representing Suffolk County)
Elmont, New York, Fire District
Bergen County, New Jersey, Police Department

EXECUTIVE SUMMARY

New York Metropolitan Advisory Committee (NYMAC), hereafter referred to as the "Committee", commends the Federal Communications Commission, hereafter referred to as the "Commission", on the extensive effort it has undertaken to address the Digital television issue. The Committee recognizes the complexity of this task and fully supports the Commission's efforts to accommodate the development and implementation of DTV channels in a fair and equitable manner. Additionally, the Committee fully supports the Commission's efforts to consolidate the present 400 MHZ of television spectrum into a more condensed core. To this end, the consolidation of television spectrum will enable the Commission to more easily implement the recommendations of the recently submitted Final Report of the Public Safety Wireless Advisory Committee.

Herein, the Committee intends to discuss the effect that the allotment of DTV channels, either adjacent to or co-channel with Public Safety land mobile radio users, will have on the performance of the critical Public Safety radio systems presently used by the member agencies. It is also our intention to urge the Commission to protect the incumbent licensees which the Commission has recognized as permanent through FCC Docket 18261 - Land Mobile Use of UHF Television Channels 14 through 20. We urge the Commission to adopt protection criteria similar to the rules which were adopted as part of FCC Docket 18261. Since the incumbent users are, in this case, in the Public Safety land mobile radio service, the criteria should protect these users from harmful interference from adjacent and/or co-channel DTV stations.

We further propose that the Commission seriously reconsider the proposed assignment of DTV channel 16 in New Haven, Connecticut and DTV channel 15 in Providence, Rhode Island in light of the negative impact this assignment will have upon the land mobile radio users licensed to operate within UHF TV channel 15 in the New York City metropolitan area.

Public Safety land mobile radio stations operate in the public interest using public funding. In carrying out its responsibility to implement the public interest, the Commission should not adopt policies and channel assignments that serve the interests of the broadcast industry, a "for profit entity", at the expense of incumbent Public Safety licensee. Under the FCC Docket 18261, which authorized land mobile use of UHF TV channels 14 through 20, New York City and Northeastern New Jersey were authorized use of UHF TV channels 14 (470-476 MHZ) and 15 (476-482 MHZ). Substantial public resources have been committed pursuant ti this authorization. As authorized licensees, the New York Metropolitan Advisory Committee believes that the Commission must protect the incumbent licensees, especially the Public Safety agencies who will surely be impacted, negatively and substantially, as proposed by the DTV assignments made under the pending FCC Docket No. 87-268, The Sixth Further Notice of Proposed Rule Making.

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INTRODUCTION

The New York Metropolitan Advisory Committee (NYMAC) hereafter referred to as the "Committee", submits comments on the above referenced FCC Docket. This standing committee was originally formed as the New York Metropolitan Spectrum Relief Committee to request a waiver of Parts 2 and 90 of the Commission's Rules to permit the assignment of frequencies in the 482-488 MHz band (UHF TV Channel 16), for the Public Safety radio services at or in the vicinity of New York City. Through their submission and subsequent grant of a Request for Waiver, filed with the Commission on April 6, 1992 and supplemental submission of Request for Waiver on April 14, 1994 the Committee was formally referred to the Commission under FCC order 95-115 as the New York City Public Safety Agency Coordinating Committee; it is now referred to as the New York Metropolitan (Metro) Advisory Committee (NYMAC).

The Committee includes several New York City agencies as well as agencies from the surrounding metropolitan area.

The following agencies are affected by the above referenced docket:

THE NEW YORK POLICE DEPARTMENT (NYPD)

The NYPD is the largest municipal law enforcement agency in the United States responsible for the protection of life and property in the largest city in the nation. The department has recently received national recognition for one of the greatest reductions in crime in the history of our nation. There are over 32,000 sworn officers, 7,000 civilians and 2,000 traffic agents. The Communications Division handles over 10 million 9-1-1 calls for police, fire and emergency medical services and dispatches over 4.2 million radio runs annually for police services. Wireless communications has a critical role in the department's responsibility for protecting life and property. The NYPD presently has 24,000 portable, 1,000 mobile and 2,500 mobile data radios. The radio system is comprised of 100 channels; 68 voice channels, of which 34 are within UHF TV channel 15 (see Attachment A); and 32 data channels. The infrastructure includes 323 base station repeaters, 1,555 satellite receivers, 100 emergency control stations, 68 dispatch positions and a six site digital microwave system. The radio system infrastructure is presently valued at over $100 million and would cost approximately $200 million to replace in today's economy.

The NYPD is divided into 76 precincts, 4 highway districts, 12 transit districts, 9 housing police service areas, emergency service units, mounted units, aviation units, harbor units and various uniformed task forces. In addition to these units the NYPD also has narcotics, organized

crime, anti-terrorist and various other specialized task forces. The department also performs dignitary protection jointly with the United States Secret Service and has members actively assigned to all Federal Law Enforcement Agencies with offices in New York City.

The NYPD radio system is divided into 35 dispatch zones which typically include two to three precincts. In addition to the dispatch zones, the department has citywide clear and encrypted voice channels to support the various units that require specialized communications. The department also provides and supports interoperability channels for communications with other NYC agencies and adjoining jurisdictions. The radio system is presently undergoing major capital improvements ($36 million) which upon completion will return the system to a state of good repair. In addition, the New York City Transit Authority is funding a $130 million project which will provide for radio communications for the NYPD, New York City Fire Department, including its Bureau of Emergency Medical Service, as well as providing for interoperability communications among various other agencies throughout the New York City Transit System.

THE NASSAU COUNTY POLICE DEPARTMENT (NCPD)

The NCPD, located in Long Island, New York, is a 3,819 member agency responsible for all aspects of law enforcement and the protection of life and property within a geographic area of 287 square miles. In addition to traditional law enforcement duties, the department is responsible for the administration and operation of the county wide Emergency Medical Service. The population served by this department is in excess of 1.4 million people. During 1995 this

department received over 700,000 emergency 9-1-1 calls. Of these, approximately 40,000 calls required the response of Emergency Medical Services.

Nassau County directly borders metropolitan New York City. It extends 20 miles at its widest point, and encompasses 193 linear miles of shoreline and 4,326 miles of public roadways. The Nassau County Police Department operates 8 patrol precincts and numerous specialized units including aviation, marine, K-9, mounted, highway patrol, emergency services (heavy rescue), special operations (S.W.A.T. and tactical patrol functions), detectives and numerous other community service units. There are up to 400 radio equipped patrol and special response units in service at any given time.

The Nassau County Police Department operates a fourteen channel radio system on frequencies between 476 - 482 MHz within UHF TV channel 15 (see Attachment A) and a five channel mobile data system. There is also a 460 MHz, 10 channel conventional Emergency Medical Services radio system with full cardiac telemetry capability, and three 150 MHZ Air/Marine and inter-agency mutual aid channels. The Police and EMS radio systems are comprised of 16 receiver sites, 5 transmitter sites, numerous control stations, over 1,500 mobile and portable units and over 400 mobile data radios. The system is interconnected by an extensive microwave backbone. The department has recently invested over 15 million dollars for a major upgrade of all communications systems. At the present time the NCPD experiences nightly interference from a Hampton-Norfolk, Virginia Beach, Virginia NTSC television station on channel 15, virtually overriding police radio transmissions along the entire south shore of Nassau

County, Long Island. This interference is tolerated but in effect continues to jeopardize all Public Safety communications throughout Nassau County.

THE NEW YORK CITY FIRE DEPARTMENT, BUREAU OF EMERGENCY MEDICAL SERVICES (EMS)

The Bureau of Emergency Medical Services is the largest provider of emergency medical services in the nation, responding to over one million calls a annually. This is more than the next five busiest cities combined. EMS is the sole provider of pre-hospital emergency medical services through the New York City 9-1-1 system and plays a critical role in the delivery of life-saving services in New York City. The EMS radio system consists of 1,200 portable and 600 mobile radios. It operates on six UHF channels (UHF TV channel 15) using 18 base station repeaters, 75 voting receivers installed on 35 sites throughout the New York City area.

THE BERGEN COUNTY, NEW JERSEY, POLICE DEPARTMENT

Bergen County, with a current population of over 860,000 residents, is the largest county in the state of New Jersey in both population and number of municipalities and ranks 55 among the nation's 3,000 counties. Bergen County is adjacent to the City of New York and one of its municipalities, Fort Lee, is the western terminus for the George Washington Bridge. Within the borders of the county is the New Jersey Sports and Exposition Authority's Sports Complex consisting of Giants Stadium, Continental Arena and the Meadowlands Race Track. Within the last few years, this facility has been the location of World Cup Soccer, a Papal visit and the site of the Stanley Cup Hockey Championship. Teterboro Airport, the nation's busiest executive airport, is located in the central portion of the county. Teterboro is a favored location for the

arrival and departure of VIP's and diplomats visiting the area which requires regular interaction with the Secret Service and the Department of State. The Bergen County Police Department's Bomb Squad is routinely involved in security sweeps of facilities and aircraft at the airport whie dignitary protection and escort services are needed to assure the VIP arrives and departs without incident. Both Teterboro and Newark International Airport have flight paths that cover the county.

The Bergen County Police Department serves the 70 municipalities within the county with patrol and specialized services. The county police patrol state highways, county roads, perform basic police protection, and are called upon to provide additional assistance to local police departments in a multitude of situations. The County Police operates specialized units such as hostage negotiations, special weapons and tactics (SWAT), a bomb squad, K-9, and traffic. The County Office of Emergency Management is under the County Police and it coordinates the operation of the County Emergency Operation Center and a Mobile Headquarters Vehicle. The department has experienced a constant rise in requests for service and arrest and summons activity, as well as an increasing need to expand services to meet the rising requirements of the citizens.

The Bergen County Police Department also provides communication facilities for the County Prosecutors Office, the Bergen County Sheriff, and the County Narcotics Task Force. There are over 500 radio units assigned to two (2) UHF repeater channels within UHF TV channel 15 that are subjected to daily interference conditions from co-channel users. The county urgently needs to expand communication capabilities to increase the effectiveness of the system and to

provide "secure" capabilities to officers in high risk assignments (i.e., drug enforcement, surveillance. dignitary protection).

BACKGROUND

The Commission recognized the needs of the Public Safety community when it approved Docket 18261 granting sharing of UHF TV channels in the top urban areas of the United States. In doing so the Commission also recognized the vital role that reliable and interference free communications plays in Public Safety's critical mission of protecting life and property. This was in response to the growing need for additional spectrum to meet the communications requirements of Public Safety. These channels are presently in use throughout the United States and for the most part constitute an extemely large base of installed infrastructure. This infrastructure has been developed over the 25 years since the TV sharing agreement was signed, at a significant expense to these municipalities and ultimately the taxpayer.[1]

The concerns of the Committee focus on the harmful interference which will be caused by the co-channel assignment of DTV channel 15 to Providence, Rhode Island and the adjacent channel assignment of DTV channel 16 in New Haven, Connecticut as proposed in MM Docket No. 87-268. These assignments are immediate threats to existing, licensed Public Safety land mobile users of UHF television channel 15 frequencies (476-482 MHz). These users are within

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[1] See 47 CFR §2.106, Notes NG66, NG114 and NG127. There are 13 urbanized areas where channels may be used for land mobile operations: New York-Northern New Jersey; Los Angeles; Chicago-Northwestern Indiana; Philadelphia, PA-New Jersey; Detroit; San Francisco-Oakland, CA; Boston, MA; Washington, DC- Maryland- Virginia; Pittsburgh, PA; Cleveland, OH; Miami, FL; Houston, TX; Dallas, TX.

the fifty (50) mile radius as referenced in 47 CFR Part 90 Subpart L, Authorization in the Band 470-512 MHz (UHF-TV Sharing).

Current rules permit frequencies in the UHF TV channel 14 and 15 bands to be available for assignment in areas within 50 miles of the geographical center of the New York/North East New Jersey area as referenced in FCC Rules and Regulations, Part 90, section 90.303 and 90.305. Mobile units and control stations may be operated within 48 km. (30 mi.) of their associated base stations. The above parameters give a potential area of mobile operation that is 128 km. (80 mi.) from the geographical center of the NYC urbanized area.

Sections 90.307 and 90.309 of the FCC Rules and Regulations, Part 90, provide the criteria and tables for antenna height and geographical separation distances in order to determine ERP limits for land mobile radio (LMR) stations. The channel assignment criteria, in NYC, is based on 40 dB protection of the television service. The geographical separation from the center of the NYC Urbanized Area to the New Haven, CT transmitter site is 71.48 miles (115.03 Km) in the direction of 49.5 degrees azimuth. The geographical separation from the center of the NYC Urbanized Area to the Providence, RI transmitter site is 160.43 miles (258.18 Km) in the direction of 61.3 degrees azimuth.

According to 90.307 (d), the minimum distance between a land mobile base station which has associated mobile units and a protected adjacent channel television station is 90 miles (145 Km). In reality, the existing licensed systems and the users in UHF channel 15 band are less than 90 miles from the New Haven, CT site and more likely less than 60 miles. These same users are

within approximately 120 miles from the proposed Providence, RI DTV transmitter site. The current proposal before the Commission places the incumbent licensees in violation of the protection criteria as defined in FCC 18261.

476 - 482 MHz Spectrum Utilization

The following charts are representative of the New York City metropolitan area usage of radio frequency spectrum between the 476-482 MHz band (UHF TV channel 15) for all services of land mobile radio operations. The committee has prepared the following table to illustrate the concentration of land mobile users within a 50 mile radius of coordinates; Lat. N40-45-06 -- Long. W073-59-39 as specified under the FCC Rules and Regulations, Part 90 Subpart L, Section 90.303. Attachment B is a complete compilation of all land mobile users licensed within the UHF TV channel 15.

Call Signs	FB/FB2	FX1	MO
Industrial Services			
182	350	111	5054
Land Transportation Services			
12	26	5	1635
Public Safety Services			
(PP) 100	294	423	21,633
(PL) 22	18	121	1,293
(PF) 5	8	3	170
(PS) 1	1	0	200
(PH) 3	4	0	120
TOTAL 131	325	547	23,446

( ) Indicates type of service.

COMMENTS

In the Second and Sixth Further Notices, hereafter referred to as "Notice(s)", the Commission proposes to use the same criteria for protection that currently exists between NTSC stations and land mobile radio. The proposed allocation of DTV channel 16 in New Haven, CT places the incumbent LMR licensees in violation of the current FCC Rules and Regulations (§90.307(d)). This criteria was intended to protect NTSC licensees from harmful interference from land mobile. Given that the UHF TV sharing agreement grants the land mobile users permanent licenses on channels 14 - 20 the Commission should adopt protection criteria that protects the incumbent land mobile users. Subpart L of the Commission's regulations provide for protection criteria which protect broadcast television stations in the 470-512 MHz range from interference from land mobile licensees. If the 470-512 MHz band is truly a shared band, land mobile users, particularly Public Safety users, should be afforded the same protection criteria as television broadcast stations.

The Commission further proposes that in some instances it may be necessary to allot DTV channels well within the adjacent or co-channel spacings. In these cases, the Commission must consider the permanent status of the incumbent licensees and strictly adhere to a protection criteria that protects the incumbent land mobile users. Even the Commission's consideration of short spacing between DTV and land mobile radio only makes the argument for a protection criteria more viable. The Committee recommends that the Commission require a new DTV station to identify potential interference to incumbent land mobile users. If the potential for interference exists, the Commission must require the new DTV station to employ adequate filtering or other necessary precautions to prevent disruption of the Public Safety communications infrastructure.

The Notices also indicate that DTV stations will be allowed to increase the transmitter output to duplicate their present coverage in anticipation of the differences between an NTSC signal and a DTV signal and the frequency propagation characteristics of the new DTV channel. The DTV emissions mask (see Attachment C) shows significant spurious emissions both above and below the channel bandedge. The use of television DTV channel 16 in New Haven Connecticut, at a power level in excess of one million watts, will have a significant impact on existing UHF TV Channel 15 (476-482 MHz) Public Safety users in the New York metropolitan area. DTV channel 15 in Providence, RI, with a proposed power level in excess of 1.7 megawatts, will also adversely impact these same users. (See Attachment C)

The Committee recommends that the Commission adopt a similar criteria[2] that protects the NTSC licensees from interference from land mobile radio to protect the incumbent licensees from harmful interference from the DTV licensee. The incumbent users, as permanent licensees, who have made substantial capital investments, all from public resources, should not encounter a DTV station operating within the co-channel or adjacent channel limitations. The Committee further requests that the proposed allocation of DTV channel 16 in New Haven, CT and DTV channel 15 in Providence, RI be disallowed on the basis that it will cause harmful interference to land mobile radio users in the New York Metro area.

The Commission further proposes that it may be necessary to impose additional conditions in those cases where the spacing cannot be met. Although these intentions are sincere, the imposition of additional conditions for short spacing will not eliminate the harmful interference

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[2] FCC Part 90, Subpart L

that the operation of a DTV channel in New Haven will cause to the Public Safety land mobile users on UHF TV channel 15 in the New York City, Nassau County, and Suffolk County areas, as well as the co-channel licensees in the metropolitan Boston area. For these reasons alone the Commission should not allocate DTV channel 16 in New Haven, CT and DTV channel 15 in Providence, RI. In addition, the assignment of DTV channel 15 in Rhode Island, even though Providence is outside of the proposed 155 mile limitation, will also impact land mobile UHF TV channel 15 operation in New York City and Nassau County as well as co-channel operation in Boston, Massachusetts. This is due to the proposed increase in ERP allowed by the Notice to overcome coverage deficiencies. Land mobile radio users in New York City and Nassau County, for the most part, are separated from New Haven and Providence by the Long Island Sound. In effect, this creates a virtual duct or waveguide by which the DTV signal will propagate. Normal protection criteria for land mobile radio cannot be considered typical in this instance and, therefore, short spacing will not be acceptable.

SUPPORTING DOCUMENTATION

Attachment B is a propagation model based on DTV technical information as listed in the NPRM, FCC database, and actual terrain information. Referencing the FCC's Part 90 Rules and Regulations, the Committee will illustrate that the assignment of DTV channels 15 and 16 will cause harmful interference to the incumbent land mobile users.

As for the Providence, RI proposed DTV site, the current subpart L allocations provide co-channel requirements on ERP and HAAT. FCC Rules and Regulations, Part 90, section 90.307(a) cites that for New York, NY, tables B & E are to be used for antenna heights less than

500 ft (152 m) HAAT. Section 90.307 further details use of calculations using smooth earth radio horizon paths or actual terrain considerations.

Co-channel LMR radio stations, in New York City, with antenna heights of 500 feet or less will experience harmful co-channel interference as a result of the assignment of DTV channel 15 to Providence, Rhode Island. Use of gain antennas for enhancing portable radio talkback coverage increases the receiver's susceptibility to co-channel interference. For stations greater than 500 feet, Figure B in FCC Rules and Regulations, Part 90, section 90.309(b)(7) must be linearly interpolated to obtain the required power reduction below 1 kilowatt. The linear interpolation for the separation of 160 miles shows no reduction from 1 kW except for HAATs of greater than 1500 ft (457 m).

The above co-channel situation illustrates that the ERPs of incumbent stations are not affected except for extremely high locations (in excess of 1500 feet HAAT). This fact is significant since the two most prominent structures in the NYC area are the Empire State Building and the World Trade Center and both locations are less than the 1500 feet HAAT. For the reasons set forth below, this circumstance raises significant issues:

- ERP (Effective Radiated Power) is related to the antenna system gains and cable losses.
- The antenna gains are relevant for this co-channel situation.
- The co-channel antenna gain for both receivers and transmitters for fixed base stations on UHF TV channel 15 range from 0 dBd to 10 dBd but are typically around 6 dBd.

- The typical antenna cable loss to the antenna has been averaged for area transmitters at around 1.3 dB.

Digital Television Station Parameters

The DTV average Power Envelope Mask is being used as the reference for the power levels at the various co-channel and adjacent channel models (See Attachment C). For the co-channel case, the average ERP of the DTV station will be as listed in the NPRM, since it is on band. For the adjacent channel case, the average power level at the DTV bandedge is -35 dB and -60 dB at +/- 6 MHz. The precise formula is attenuation = 35 + (f_d^2/1.44) dB where f_d is the frequency displacement in MHz from the bandedge. The DTV station ERP levels utilized have been taken directly from the FCC Docket 87-268.

Land Mobile Radio Receiver

Since the average DTV signal is spread out over 5.38 MHz and the land mobile radio receiver Effective Noise Bandwidth (ENBW) is about 15 KHz within a 25 KHz bandwidth channel. The actual power intercepted by the land mobile radio receiver should be down from the average DTV signal measured across the 6 MHz DTV bandwidth.

The precise formula used is:

$$\text{Power Level intercepted} = P_{dtv} - 10 \log(15 \text{ KHz} / 5.38 \text{ MHz}) \text{ dB}$$

$$= P_{dtv} - 25.5 \text{ dB}$$

Antenna Polarization Discrimination Factors

Typical TV broadcast signals are transmitted with horizontal polarization while land mobile radio signals are transmitted with vertical polarization. Estimates of the discrimination losses encountered between horizontal and vertical polarization range from -10 to -30 dB. The engineering model we present utilizes a -10 dB discrimination factor. The New York City area is a dense suburban and urban area that has high multipath environments. Less discrimination is observed in these environments. The characterization of multipath phenomena is a complex issue. Multipath propagation phenomena models are extremely important due to its effects on land mobile radio in urban centers. Multipath propagation is attributable to scattering of the radio signal from surfaces of buildings and their diffraction over and/or around them. Radio frequency energy arrives from different directions combining vectorially at the receiver antenna to give a resultant signal which can be large or small depending on the distribution of phases amongst the component waves. With the multipath scattering phenomena, incoming radio wave incident angles that are horizontally polarized become diffracted and scattered from oblique surfaces to create waves that do not travel horizontally. In a high density urban environment such as New York City with its many structures, horizontally polarized waves will be diffracted and scattered countless times creating radio frequency signal elements in the vertical plane. The engineering model presented is based on the DTV broadcasters' continued use of horizontal polarization with the aforementioned discrimination loss factor.

Relevant Propagation Model Factors

It would be unrealistic to model the interference profiles based on free space propagation losses since this would not provide a true picture of important factors such as natural obstructions

in terrain. We will be using the Longley-Rice propagation model as utilized in the FCC docket. The following parameters are incorporated:

i.	Reliability:	10% (Interference)
ii.	Confidence:	50% (Median Radio Signal)
iii.	Climate:	Maritime Temperate over Land
iv.	Refractivity:	Nominal Value
v.	Ground Mho & Sigma:	Average Values
vi.	Terrain Irregularity:	100 ft
vii.	Receiver sensitivity:	0.5 microvolts

Propagation over Water or Flat Open Areas

Propagation to the New York City Area from areas Northeast (DTV 15 & 16 proposed allocations) pose an interference potential due to over water propagation characteristics. In general, permittivities and conductivities of water play important factors to the received strength in the New York City metro area. These factors led to the selected radio frequency climate for the engineering model.

Long Distance Propagation

The broadcast stations intentions are to cover an extremely wide area with their respective stations. With this factor, the long distance propagation issues will affect interference signals. For areas within 50 miles of the DTV transmitter sites, the low-atmospheric phenomenon would cause the ground wave path to propagate in a non-straight line fashion. The phenomenon is

usually more pronounced over seawater because the atmospheric situation over the ocean (Long Island Sound in this case) can be varied based on the different altitudes. The wave path can bend either upward or downward. There may be instances where one spot may have strong radio signals at one time but weaker ones at another. Tropospheric wave propagation can be divided into refraction and reflection.

Tropospheric Refraction: This refraction is a gradual bending of the rays due to the changing effective dielectric constant of the atmosphere through which the wave is passing.

Tropospheric Reflection: This reflection will occur where there are abrupt changes in the dielectric constant of the atmosphere. The distance of propagation is much greater than the line of sight propagation.

Moistness: Actually water content has much more effect than temperature on the dielectric constant of the atmosphere and on the manner in which the radio waves are affected. The water vapor pressure decreases as the height increases.

Trapping or duct propagation can occur due to the above factors. Surface ducts may appear over water. As a side note, tropospheric wave propagation interference can only be controlled by directional antennas and prudent engineering in transmitter design.

ISSUES OF CONCERN

Portable and Mobile Receiver Desense

The typical Public Safety land mobile receiver (portable and mobile) utilizes a wideband front end. These radios will experience receiver desensing, which will cause harmful interference, if the proposed New Haven, CT DTV Channel 16 and/or the proposed DTV channel 15 in Providence, RI transmitters are permitted to go on the air.

The digital television emission mask shows significant emissions in the range above and below the DTV bandedge. UHF TV Channel 15 Public Safety users on Long Island will be especially affected by DTV operations in New Haven, CT and Providence, RI as they are significantly closer to the DTV transmitters than the New York City agencies and in fact are only separated from New Haven by the Long Island Sound.

In close proximity to a TV transmitter site, the power from an adjacent TV station couples into the receiver front end, and/or directly through the case into the receiver. There is a potential for land mobile users to hear constant noise when in close proximity to a TV transmitter site. This will be the case with land mobile receivers in the northern part of Nassau County as they are less than 40 air miles from the DTV transmitter in New Haven and less than 135 air miles from Providence.

Proposed geographical DTV to land mobile radio separation for adjacent channel operation is 110 miles to urban center. New Haven, Connecticut is only 71.5 miles from the center of New York City and less than 60 miles from the northeast portion of New York City which is only separated by the Long Island Sound. Land mobile users in Nassau County are less than 40 air miles from New Haven and directly across the Long Island Sound.

Fixed (Voting) Receiver Desense

Public Safety agencies in New York City and Nassau County utilize voting receivers to enhance portable radio talkback coverage. These receivers are located on tall buildings or towers throughout the coverage area, using high gain (typically 6 to 9 dB) omnidirectional antennas.

These voting receivers operate on frequencies both adjacent and co-channel to the DTV allocations in New Haven and Providence, respectively. At the proposed DTV transmit power level of over one million watts transmitted from a station in New Haven (adjacent channel) and Providence (co-channel), the desensitization of land mobile Public Safety voting receivers in the New York City and Nassau County is inevitable. This concept forms the basis for the engineering analysis.

In order to minimize this problem, New York City and Nassau County Public Safety land mobile users operating on UHF TV channel 15 will be forced to reconfigure their voting receiver systems by lowering antenna heights and installing low gain or unity gain antennas. This would require an increase in the number of voting receivers, radio tie lines and/or microwave links required to obtain the same level of coverage, all at the expense of the taxpayer. Additional high selectivity filtering may also be required at every voting receiver site. Despite the cost to implement these improvements to the existing infrastructure, there is a substantial risk that these modifications will not completely eliminate the interference.

VISUAL PREDICTION OF COVERAGE AREAS

We are presenting a series of interference profiles using the Micropath 2000 Visual Predicted Area Coverage Program (VPAC). Micropath 2000 is a radio frequency analysis program designed to provide plots of any given area of the contiguous United States. The software is a propagation analysis tool that provides a modeling environment for radio engineers to try different parameters on a path or an area of coverage before having to commit the design to the real world. The software is based on overlay files representing jurisdictional boundaries, locations of transmitters and receivers, and the surface terrain elevations. Included in the software

are the capabilities of modeling transmitters and receivers with appropriate gains, losses, threshold values, horizontal and vertical antenna patterns in addition to selection of the appropriate propagation model (i.e. Longley-Rice). Coverage predictions are displayed visually with colored filled areas representing a varying or particular signal level. The coverage plots are geographically scaled and labeled. (See attachment C)

CONCLUSION

Since Public Safety land mobile radio operations are publicly funded, it is reasonable to expect the Commission to protect the existing Public Safety LMR users licensed by the FCC on UHF TV channel 15 from harmful interference. The Commission should seriously reconsider the proposed assignment of DTV channel 16 to New Haven, Connecticut and DTV channel 15 to Providence, Rhode Island in light of the negative impact this assignment would have upon incumbent UHF TV channel 15 Public Safety land mobile licensees in the New York City metropolitan area.

Respectfully Submitted,

Vincent R. Stile
Chairman
New York Metropolitan Advisory Committee

November 21, 1996

INDEX OF ATTACHMENTS

ATTACHMENT A
NEW YORK CITY POLICE DEPARTMENT

UHF-TV Sharing Base Station Frequencies
476-482 MHz - TV Channel 15

476/479.3125	476/479.3375
476/479.3625	476/479.3875
476/479.4125	476/479.4375
476/479.4625	476/479.4875
476/479.5125	476/479.5375
476/479.5625	476/476.5875
476/479.6125	476/479.6375
476/479.6625	476/479.6875
476/479.7125	476/479.7375
476/476.7625	476/479.7875
476/479.8125	476/479.8375
476/479.8625	476/479.8875
476/479.9125	476/479.9375
476/479.9625	476/479.9875
477/480.0125	477/480.0375
477/480.0625	477/480.0875
477/480.1125	477/480.1375

Total number of Channel 15 Frequencies = 68